

DETAILED ACTION

Claim Objections

1. Claims 1, 9-11, and 13-18 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and/or antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following correction(s) may obviate the objection(s): (claim 1, line 11; deleting "and"), (claim 1, line 12; inserting --and-- after "power of the crystal"), (claim 9, lines 1-2, "said first weighted average"; changing the dependency of claim 9 from claim 5 to claim 8), (claim 9, line 2, "said second weighted average"; changing the dependency of claim 9 from claim 5 to claim 8), (claim 13, line 3; inserting a semi-colon after "lipid - carbohydrate complex"), (claim 14, line 1; replacing "the" with --a--), (claim 14, line 4, in the phrase "an first"; replacing "an" with --a--), (claim 14, line 8; replacing "signal to noise" with --signal-to-noise--), (claim 15, line 4; inserting --respective-- before "anomalous scattering"), (claim 15, line 5; in the phrase "said centric", replacing "said" with --the respective--), (claim 15, line 6; in the phrase "of said intensities and", replacing "said" with --the respective set of--), (claim 15, lines 6-7; in the phrase "said acentric", replacing "said" with --the respective--), (claim 15, line 7; in the phrase "of said intensities.", replacing "said" with --the respective set of--), (claim 16, line 4; inserting --respective-- before "anomalous scattering"), (claim 16, line 5; in the phrase "said centric", replacing "said" with --the respective--), (claim 16, line 6; in the phrase "of said intensities and", replacing "said" with --the respective set of--), (claim 16, line 7; in the phrase "said acentric", replacing "said" with --the respective--),

(claim 16, line 8; in the phrase "said intensities.", replacing "said" with --the respective set of--), and (claim 17, last line; inserting --ratio-- after "signal-to-noise").

Claim 10, 11, 13, 15, 16, and 18 are objected to by virtue of their dependency. For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 8 recites the limitation "the first intensity difference" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is not clear as to which first intensity difference "the first intensity difference" is referring. Claims 9-11 are rejected for the above reason by virtue of their dependency.
4. Claim 8 recites the limitation "the second intensity difference" in line 4. There is insufficient antecedent basis for this limitation in the claim. It is not clear which second intensity difference "the second intensity difference" is referring. Claims 9-11 are rejected for the above reason by virtue of their dependency.

5. Claim 8 recites the limitation "said intensities" in lines 3 and 5. There is insufficient antecedent basis for this limitation in the claim. It is not clear which intensities "said intensities" are referring. Claims 9-11 are rejected for the above reason by virtue of their dependency.

6. Claim 9 recites the limitation "the first intensity difference" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is not clear as to which first intensity difference "the first intensity difference" is referring. Claims 10 and 11 are rejected for the above reason by virtue of their dependency.

7. Claim 9 recites the limitation "the second intensity difference" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is not clear which second intensity difference "the second intensity difference" is referring. Claims 10 and 11 are rejected for the above reason by virtue of their dependency.

8. Regarding claim 10, the claim depends on claim 9, which has now been examined as being dependent on claim 8 as explained above. However, it is not clear how the step of calculating a first weighted average includes both a step of dividing said average first intensity difference by the standard deviation (in claim 8) and a step of dividing said average first intensity difference by the square of the standard deviation (in claim 10). Since it is not clear as to how the step does both calculations, the claim has been rejected as being indefinite.

Furthermore, it is not clear how the step of calculating a second weighted average includes both a step of dividing said average second intensity difference by the standard deviation (in claim 8) and a step of dividing said average second intensity difference by the square of the standard deviation (in claim 10). Since it is not clear as to how the step does both calculations, the claim has been rejected as being indefinite.

Claim 11 is rejected for the above reasons by virtue of its dependency.

9. Claim 10 recites the limitation "the first intensity difference" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is not clear as to which first intensity difference "the first intensity difference" is referring. Claim 11 is rejected for the above reason by virtue of its dependency.

10. Claim 10 recites the limitation "the second intensity difference" in line 4. There is insufficient antecedent basis for this limitation in the claim. It is not clear which second intensity difference "the second intensity difference" is referring. Claim 11 is rejected for the above reason by virtue of its dependency.

11. Claim 10 recites the limitation "said intensities" in lines 3 and 5. There is insufficient antecedent basis for this limitation in the claim. It is not clear which intensities "said intensities" are referring. Claim 11 is rejected for the above reason by virtue of its dependency.

12. Claim 11 recites the limitation "the first intensity difference" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is not clear as to which first intensity difference "the first intensity difference" is referring.

13. Claim 11 recites the limitation "the second intensity difference" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is not clear which second intensity difference "the second intensity difference" is referring.

14. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: combining two or more *discrete sub-groups*, thereby generating a combined X-ray diffraction data set having an anomalous scattering signal-to-noise ratio greater than the anomalous scattering signal-to-noise ratios of said *discrete sub-groups*.

The claim calls for dividing data into discrete sub-groups and then combining two more merged subgroups. However, one cannot even combine merged subgroups without first having an essential step of generating a merged subgroup. Therefore, the claim is rejected for omitting essential steps.

For purposes of examination, the claim has been interpreted with the following changes: (in line 7 of claim 19; replacing "merged subgroups" with --discrete sub-groups--) and (in line 9 of claim 19; replacing "merged subgroups" with --discrete sub-groups--).

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

15. Claims 1 and 13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims are directed to a judicial exception. As such, pursuant to the Interim Guidelines on Patent Eligible Subject Matter (see the OG Notice dated November 22, 2005, and MPEP 2106), the claims must have either physical transformation and/or a useful, concrete, and tangible result.

The claims fail to include transformation from one physical state to another. Although the claims appear useful and concrete, there does not appear to be a tangible result claimed. Merely calculating an anomalous scattering power of the crystal is not sufficient to constitute a tangible result, since the outcome of the calculating step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. As such, the subject matter of the claims is not patent eligible.

An example, which would make the subject matter of the claims statutory, would be to make the following changes in line 13 of claim 1: replacing “wherein” with --using-- and deleting “is used”. Hence, the claims would have a useful, concrete, and tangible result.

Allowable Subject Matter

16. Claims 2-7 and 12 allowed. Claims 8-11 and 14-19 would be allowable if amended to overcome the corresponding claim objections(s) and rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. The following is a statement of reasons for the indication of allowable subject matter.

17. Regarding claim 2, the prior art fails to disclose or fairly suggest a method of determining an electron density distribution of a crystal, said method including the steps of: subtracting the intensities of said acentric reflection pair to obtain a second intensity difference, and calculating an anomalous scattering signal corrected for noise using said first intensity difference and said second intensity difference, in combination with all of the other limitations in the claim. Claims 3, 4, and 12 contain allowable subject matter by virtue of their dependency.

18. Regarding claim 5, the prior art fails to disclose or fairly suggest a method of determining an electron density distribution of a crystal, said method including the steps of: subtracting the intensities of said plurality of acentric reflection pairs to obtain a plurality of second intensity differences and calculating an average second intensity difference, and calculating an anomalous scattering signal corrected for noise using said average first intensity difference and said average second intensity difference, in combination with all of the other limitations in the claim. Claims 6-12 contain allowable subject matter by virtue of their dependency.

19. Regarding claim 14, the prior art fails to disclose or fairly suggest a method of monitoring changes in a signal-to-noise ratio of X-ray diffraction data, said method including the steps of: measuring a second set of intensities corresponding to a plurality of centric reflection pairs and a plurality of acentric reflection pairs and calculating a second anomalous scattering signal-to-noise ratio for said second set of intensities; and comparing said first anomalous scattering signal-to-noise ratio to said second anomalous signal-to-noise ratio, in combination with all of the other limitations in the claim. Claims 15 and 16 contain allowable subject matter by virtue of their dependency.

20. Regarding claim 17, the prior art fails to disclose or fairly suggest a method of collecting X-ray diffraction data, said method including the steps of: stopping the collection of intensities when said anomalous scattering signal-to-noise ratio is below an anomalous scattering signal-to-noise threshold, in combination with all of the other limitations in the claim. Claim 18 contains allowable subject matter by virtue of its dependency.

21. Regarding claim 19, the prior art fails to disclose or fairly suggest a method of increasing the anomalous scattering signal-to-noise ratio of X-ray diffraction data, said method including the steps of: combining two or more discrete sub-groups, thereby generating a combined X-ray diffraction data set having an anomalous scattering signal-to-noise ratio greater than the anomalous scattering signal-to-noise ratios of said discrete sub-groups, in combination with all of the other limitations in the claim.

Pertinent Prior Art

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fu et al. ("Monitoring the anomalous scattering signal and noise levels in X-ray diffraction of crystals") discloses the signal-to-noise ratios (abstract).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chih-Cheng Glen Kao/
Primary Examiner, Art Unit 2882